

WHAT IS CLAIMED IS:

1. An electromagnetic drive type actuator  
comprising:

a movable plate having a flat surface;

5 a support positioned around the movable plate;

an elastic member, which is elastically

deformable, connecting the movable plate with the  
support, the elastic member supporting the movable

plate so as to allow the movable plate to move in  
10 directions parallel to the flat surface of the movable  
plate;

wirings, which carry currents, extending through  
the support, the movable plate and the elastic member;  
and

15 magnetic field generating means for generating  
a magnetic field in a space around the movable plate,  
the magnetic field having a direction orthogonal to the  
flat surface of the movable plate, so that the movable  
plate is moved in the directions parallel to the flat  
20 surface of the movable plate by an interaction between  
the currents flowing through the wirings and the  
magnetic field generated by the magnetic field  
generating means.

2. The electromagnetic drive type actuator  
25 according to claim 1, wherein the elastic member has  
a mesh structure.

3. The electromagnetic drive type actuator

according to claim 1, wherein the elastic member comprises parts extending in two directions, which are not parallel to each other.

4. The electromagnetic drive type actuator  
5 according to claim 3, wherein the two non-parallel directions, along which the parts constituting the elastic member extend, are orthogonal to each other, the wirings comprise parts extending along two directions, which are orthogonal to each other.

10 5. The electromagnetic drive type actuator according to claim 4, wherein the magnetic field has a direction that is substantially orthogonal to the flat surface of the movable plate.

6. The electromagnetic drive type actuator  
15 according to claim 5, wherein the magnetic field generating means comprises a permanent magnet arranged in a direction that is substantially orthogonal to the flat surface of the movable plate.

7. The electromagnetic drive type actuator  
20 according to claim 5, wherein the magnetic field generating means comprises an electromagnet.

8. The electromagnetic drive type actuator according to claim 1, wherein the elastic member comprises parts extending in a direction.

25 9. The electromagnetic drive type actuator according to claim 8, wherein the magnetic field has a direction that is substantially orthogonal to the

flat surface of the movable plate.

10. The electromagnetic drive type actuator according to claim 9, wherein the magnetic field generating means comprises a permanent magnet arranged  
5 in a direction that is substantially orthogonal to the flat surface of the movable plate.

11. The electromagnetic drive type actuator according to claim 9, wherein the magnetic field generating means comprises an electromagnet.

10 12. An electromagnetic drive type actuator comprising:

a movable plate having a flat surface;  
a support positioned around the movable plate;  
an elastic member, which is elastically  
15 deformable, connecting the movable plate with the support, the elastic member supporting the movable plate so as to allow the movable plate to move in directions parallel to the flat surface of the movable plate;

20 wirings, which carry currents, extending through the support, the movable plate and the elastic member;  
and

a magnetic field generator, which generates a magnetic field in a space around the movable plate, the  
25 magnetic field having a direction orthogonal to the flat surface of the movable plate, so that the movable plate is moved in the directions parallel to the flat

surface of the movable plate by an interaction between the currents flowing through the wirings and the magnetic field generated by the magnetic field generator.

5           13. The electromagnetic drive type actuator according to claim 12, wherein the elastic member has a mesh structure.

          14. The electromagnetic drive type actuator according to claim 12, wherein the elastic member  
10           comprises parts extending in two directions, which are not parallel to each other.

          15. The electromagnetic drive type actuator according to claim 14, wherein the two non-parallel directions, along which the parts constituting the  
15           elastic member extend, are orthogonal to each other, the wirings comprise parts extending along two directions, which are orthogonal to each other.

          16. The electromagnetic drive type actuator according claim 15, wherein the magnetic field has a  
20           direction that is substantially orthogonal to the flat surface of the movable plate.

          17. The electromagnetic drive type actuator according to claim 12, wherein the elastic member comprises parts extending in a direction.

25           18. The electromagnetic drive type actuator according to claim 17, wherein the magnetic field has a direction that is substantially orthogonal to the flat

surface of the movable plate.